

Amendments to the Specification:

Please amend paragraphs [0001], [0003], [0004], [0005], [0011], [0013], [0015], [0016], [0017], [0018], [0019], [0020], [0021], [0022], [0026], [0027], [0036], [0040], [0041], and [0042] of the specification as follows:

[0001] The invention relates to a wafer lifting device having a lifting platform arranged under a wafer ~~receptacle support member~~, the top side of which forms a wafer bearing area, wherein the lifting platform can be moved toward and away from the underside of the wafer ~~receptacle support member~~, in a vertical direction. At least three pins extending in the vertical direction are arranged to move in through holes in the wafer ~~receptacle support member~~, which run from the underside of the wafer ~~receptacle support member~~ to the wafer bearing area on the top side thereof. With the lifting platform raised, in a first upper position near the underside of the wafer ~~receptacle support member~~, the pins project from the wafer bearing area by a selected amount. With the lifting platform lowered, in a second lower position remote from the underside of the wafer ~~receptacle support member~~, the pins are retracted into the ~~receptacle support member~~.

[0003] During some of these process steps and also during the testing of chips in the wafer composite, the wafers are placed on wafer ~~receptacle support members~~ and treated in a horizontal position. There are provided handling systems which take up the wafers, position them over the wafer ~~receptacle support member~~ and deposit them on the wafer ~~receptacle support member~~ by means of a vertical relative movement between wafer ~~receptacle support member~~ and handling system.

[0004] The wafer receptacle support member may be designed as a heating plate.

In particular, such heating plates are used during the process step of resist incineration.

During this process step, the wafers are heated by means of the heating plate, and the hot wafers are exposed to an oxygen atmosphere. As a result, the photoresist of a photoresist mask which is situated on the wafer oxidizes to form a volatile gas and burns without any residue.

[0005] Such wafer receptacle support members designed as heating plates are provided with a wafer lifting device. The wafer lifting device comprises a lifting platform arranged under the heating plate, which lifting platform can be moved vertically by means of a pneumatic cylinder, whereas the wafer receptacle support member is fixed. Three vertical pins which project into holes in the heating plate are fastened on the lifting platform. The holes are designed as through holes and accordingly extend from the underside of the heating plate as far as its top side, serving as wafer bearing area. The pins have a length such that they project from the wafer bearing area by a selected amount with the lifting platform raised. With the lifting platform lowered, the pins are sunk in the holes. During a lifting movement of the lifting platform, the pins are guided in the through holes.

[0011] According to the invention, the object is achieved in that a separate pin guide is provided for each pin, in which pin guide the pin is guided and held such that it can be moved longitudinally, and the pin guide is fixedly connected to the wafer receptacle support member. As a result of this, the pin is mechanically decoupled from the lifting platform in such a way that dimensional differences between the lifting platform and the wafer receptacle support member can no longer influence the movement

of the pin. Thus, a grinding of the pin and the generation of particles and also a scratching of the wafer rear side are avoided. In particular, this is beneficial in the case of wafer receptacle support members embodied as a heating plate. The heating plate has a temperature which differs from the temperature of the lifting platform. Differences in the thermal expansions may lead to geometrical differences between heating plate and lifting platform receptacle support member, the disadvantages of which can be avoided in the manner explained above. Moreover, what has a favorable effect in this application is the fact that the connection of the pin guide to the wafer receptacle support member means that the pin guide and the pin assume approximately the same temperature, thereby improving guidance of the pin.

[0013] In the case where a wafer receptacle support member is designed as a heating plate, the tolerances have to be chosen in accordance with the hot heating plate. For this intended use, Al_2O_3 (ceramic), MARCOR and VESPEL SP-1 are suitable as materials for the arrangement according to the invention.

[0015] One possibility for the configuration is that the pin guide is integrated in the wafer receptacle support member and the guide hole is formed by the through hole. Even such a simple arrangement, which can be realized with little outlay, results in the decoupling of pin and lift platform according to the invention.

[0016] Another possibility provides for the pin guide to have a cylindrical body connected to the wafer receptacle support member. The use of a separate pin guide means that the guide can be optimally configured through corresponding surface configuration of the guide areas and through suitable material pairings. A separate pin guide also makes it possible to introduce friction-reducing sliding bearings.

[0017] In this case the pin guide may be located outside the wafer receptacle support member. However, it is also possible for the cylindrical body to be introduced into a mounting hole in the wafer receptacle support member, said mounting hole being coaxial with respect to the through hole.

[0018] Given a corresponding thickness of the wafer receptacle support member, the mounting hole may extend only over part of the thickness of the wafer receptacle support member. Consequently, it is possible, for example, to avoid the situation where the wafer bearing area is disturbed by an emergence of the cylindrical body. It is favorable in terms of production, by contrast, to introduce the cylindrical body into the wafer receptacle support member such that the cylindrical body has a length corresponding to the thickness of the wafer receptacle support member and the mounting hole is a through hole and has a diameter which is equal to or slightly greater than the diameter of the cylindrical body.

[0019] One possibility for the connection of the cylindrical body to the wafer receptacle support member is that the mounting hole has an internal thread and the cylindrical body has an external thread and engagement means for a screw tool and the cylindrical body is screwed into the receptacle support member hole. Thus, by way of example, the cylindrical body may be provided, at its underside, with a hexagon which projects from the underside of the wafer receptacle support member in the screwed-in state. A jaw or ring spanner can then be attached to this hexagon in order to unscrew the cylindrical body. The procedure is reversed in the course of assembly.

[0020] Another possibility for the connection of the cylindrical body to the wafer receptacle support member is that the cylindrical body, at a side perpendicular to the

center axis of the guide hole, is provided with a flange having fastening holes corresponding to screw connections in the wafer receptacle support member. This solution is favorable in particular when the wafer receptacle support member is configured as a heating plate, since here larger tolerances of the individual components are possible and, consequently, it is possible to avoid jamming on account of different thermal expansions.

[0021] In the variant with the flange plate, in one embodiment, the fastening holes lie opposite corresponding threaded holes in the wafer receptacle support member into which fastening screws can be screwed through the fastening holes.

[0022] In another embodiment, threaded bolts are introduced in the wafer receptacle support member, which threaded bolts pass through the fastening holes in the flange and can be screwed onto nuts.

[0026] In the case where the wafer receptacle support member is configured as a heating plate, one configuration of the invention provides for the spring to be composed of a material having a spring durability of greater than 250°C, preferably up to 800°C. It can thus be ensured that the helical spring maintains its spring properties even in this case. INCONEL X750 has proved to be an expedient material here.

[0027] The invention will be explained in more detail below using an exemplary embodiment in which the wafer receptacle support member is embodied as a heating plate.

[0036] As illustrated in figs. 1 and 2, a pin guide 1 has a cylindrical body 2. The body 2 is provided with a flange plate 3 at its underside. The flange plate 3 is provided

with fastening holes 4, through which fastening screws 5 can be screwed into threaded mounting holes in the wafer receptacle support member 6.

[0040] As illustrated in figs. 3, 5, 6 and 8, the cylindrical body 2 is inserted into mounting holes 14 in the wafer receptacle support member 6 and may be held by means of the fastening screws 5. The pins 8 are pressed upward by a lifting platform 15 during a lifting movement and then protrude from the wafer receptacle support member area 16. This is illustrated in figs. 3 to 5. In this position, a fork (not specifically illustrated) of a handling device deposits a wafer 17, which bears on it during transport, on the projecting pins 8. The fork can thus be pulled out from under the wafer 17.

[0041] As illustrated in figs. 6 to 8, the lifting platform 15 is then moved downward, the helical springs 13 likewise pressing the pins 8 downward. As a result, the pins 8 are sunk in the wafer receptacle support member 6 and the wafer 17 bears on the wafer receptacle support member area 16 of the wafer receptacle support member and is heated by the latter, as a result of which an activation energy required for a resist combustion process is introduced into the wafer 17.

[0042] In order to remove the wafer 17 after this process step, the lifting platform 15 is raised, as a result of which the pins 8 release the wafer 17 from the wafer receptacle support member area 16 and the fork can remove the wafer 17.